logue and check list of the trees and woody shrubs of America, north of Mexico, by John W. Byrkit. It occupies fifteen pages of the report. Mrs. Haines also contributes a list of the ferns, mosses, hepaticæ and lichens of Wayne county, Indiana.——*Grevillea* for March and June contains an article by Dr. M. C. Cooke, strongly opposing the "dual lichen hypothesis," proposed by Schwendener.——The death of the following botanists has recently been announced: Elisabetha, Contessa Fiorini-Mazzanti, author of many papers on Algæ, etc.; of Thilo Irmisch, well known for his memoirs on the morphology of Phanerogams; of E. Spach, a voluminous author of systematic works and papers; of Prof. Karl Koch, of Berlin, best known as a horticultural botanist, as was David Moore, the well-known director of the Glasnevin Botanic Gardens, Dublin, who died June 9th at the age of seventy-two years; Tilbury Fox, M.D., who had given attention to the part played by minute fungi in producing skin and hair diseases, died at Paris, June 7th. We may add to the list Wm. Schimper, who, according to Gray, was the schoolmate of Agassiz, and one of the first investigators of phyllotaxy; he spent most of his life in Abyssinia.

ZOÖLOGY.[1]

THE SPADE-FOOT TOAD IN NEW HAVEN, CONN.—For more than two years I have been looking for the "spade-foot" (*Scaphiopus holbrookii*) in and about New Haven, confident that it occurred here and that careful search would reveal it; but my efforts have been vain until very lately. Thursday, April 24th, I saw some children gathered around an object on the pavement of Prospect street, and I asked them what they had. They replied that they had dug up a toad in the next yard. You can imagine my surprise and delight to behold a real live "spade-foot," the first I had ever seen alive. They willingly gave it to me, and I carefully took it home with me and kept it alive in a large box with plenty of earth and a tub of water.

Tuesday morning (the 29th) I was shooting small birds near Fair Haven, when I heard a most peculiar bellowing from a pond near by. I am more or less familiar with all the ordinary sounds that come from a pond, and I jumped at the conclusion that I heard the "spade-foot." On reaching the pond I saw a sight I shall never forget; the pond was rather small, and was swollen and overflowing on account of the heavy rains of the two preceding days, and swimming all over the surface, and at times uttering their peculiar bellow, were forty or fifty of my long-sought friends. They would float or swim awkwardly along until they wished to favor me with a song, and then the accommodating soloist would suddenly assume a perpendicular position as if a plummet had been attached to his tail, his head alone show-

[1]The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.

ing above the water, his white throat dilated till it was three times the size of the head, his mouth closed tight, he would sing his brief song and reassume his horizontal position. The pond was quite deep in the middle, but I secured some specimens to prove my statements on my return home.

When I passed the pond again in the afternoon the same programme was being carried out, but I could secure no more specimens. On my return home I put my toad with the one I found Thursday, and in a few moments the male (the last caught) had clasped the female very tightly and I was expecting to raise some tadpoles, but they buried themselves in the earth the next day without laying any eggs.

In the afternoon of Tuesday a friend of mine, Mr. W. H. Fox, found the Scaphiopus in a pond out on Prospect street, and secured quite a number of specimens together with some spawn which he thinks belongs to this toad.

The next day (Wednesday, April 30th) I visited my pond again with net and pails, but the birds had flown without leaving a sign. Not a toad was to be seen or heard, and no spawn but frog spawn could be found; but they may have dropped it in the deeper water in the middle of the pond, out of my reach and sight. Mr. Fox visited his pond also Wednesday, but could not find a toad except the common one (*Bufo americanus*).

When I brought my first specimen home she buried herself in the earth, but when I returned from Fair Haven she was swimming around in her tub of water like the rest of them, and when I put the male in they stayed in the water together. Wednesday morning when the toads in the two ponds had disappeared, my pair had also buried themselves again in the earth in their box. So I think I can judge of the movements of the free toads by watching the movements of my captives.—*Fred. Sumner Smith.*

THE SHEDDING OF THE TRACHEÆ AND DOUBLE COCOONS.—It is a physiological rule in insect growth that the lining of the tracheæ, and of such other parts as are more or less subject to the action of the air, is shed with the external skin. This is the case even with those ramifications of the tracheæ where the lining is not so fine as to be absorbed. I was somewhat surprised, therefore, to find Mr. Edward Potts, in a late number of the NATURALIST, recording the fact as something interesting and new.

The same remarks apply to his observations about finding two chrysalids in a single cocoon of *Bombyx mori*. These so-called double cocoons are of very common occurrence, mentioned centuries since in works on silk culture, and noticed by every one who has had much to do with the rearing of silkworms.—*C. V. Riley.*

RELATIONS OF THE CTENOPHORA TO THE JELLY FISHES.—Hæckel has recently published a paper in the Jena *Zeitschrift*, in which he describes and figures *Ctenaria ctenophora*, a medusa of

the family *Cladonemidæ*, which has an oval body with two long ciliated tentacles, causing it to strangely resemble the Ctenophore Cydippe or Pleurobrachia. Ctenaria inhabits the Pacific ocean, and is regarded by Hæckel as an immediate transitional form from Gemmaria-like Anthomedusæ to Cydippe-like Ctenophora. A full description and drawings will be published in a work soon to appear entitled "System der Medusen," to be illustrated with forty plates. He considers that the Ctenophora have originated from the order of Anthomedusæ and family Cladonenidæ, and adds a table showing the homologies between the Ctenophores and the Craspedote Acalephs.

Swimming Polypes in Deep Water.—Till recently the free-swimming polypes met with at sea, of which the Portuguese man-of-war is a familiar example, were thought to tenant only the parts close to the surface. The hydrostatic air bladder found in many of them, and its nature, sometimes quite transparent, sometimes more or less blue, were in keeping with this kind of life. Exceptions to the rule, however, are now known to occur. In 1875, when the broken Atlantic cable was being recovered, living polype-like creatures were brought up from a depth of 1780 fathoms. Dr. W. Siemens presented them to the Zoölogical Museum in Berlin. More recently Prof. Studer, on board the German ship *Gazelle*, obtained several specimens, complete and fragmentary, from the deep water, and was able to examine some of the animals while still alive. Twenty-four such cases he records. The depth of sounding line at which these siphonophora were attached were more than 300 fathoms; eleven were brought from 1500 to 2000 fathoms, and six from less than 800. Dredges in operation at the same time to 200 fathoms depth brought in no such animals, and it is inferred that those caught could not have merely got attached in lowering or raising the line. The animals belonged to the known genus Rhizophysa, and a new one (Bathyphysa). They had comparatively small swimming bladders, but no bells. Prof. Studer notes that a depth of 1000 fathoms (the average in this case) corresponds to a pressure of 181.85 atmospheres. Water would hardly be condensed at this, but the gas in the bladder of course would. Still, supposing it atmospheric air, its specific gravity when so condensed (0.235) would still be considerably under that of the sea water (1.027). The gas in the bladder, in its efforts to expand, would balance the pressure of the water column. But the animal by contracting the muscular walls of the bladder, may condense the air more and so sink; or, by releasing the contraction, raise itself. Only, in order that the volume of the gas should keep proportional to the pressure, the bladder must not come into too high layers of water, else it will be in danger of bursting. This, indeed, seems to have occurred with Siemens' Bathyphysa.—*English Mechanic.*

CAPTURE OF A SAW-FISH.—When riding on the beach at Galveston, Texas, on the 1st of April last, I noticed some Mexican fishermen drawing a seine to shore to which was attached a large saw-fish (*Pristis antiquorum*). The animal was not enclosed within the net, but some of the meshes had become engaged with the teeth of the saw, and by this attachment it was drawn several hundred feet towards the shore, the large dorsal fin alone showing above the water suggesting that a shark was entangled in the net, but if a shark it must have been a dead one, for not the least effort at resistance was made, nor even signs of life, for the object drifted in as lifeless as a log till it touched the bottom; then indeed it made a few spasmodic efforts showing terrific power, in which the head and saw were thrown high into the air and swung around in a fearful way, while the tail was lashed about, showing that a bullock could not have withstood the blows.

This demonstration did not last five seconds, but it had brought the monster considerably nearer the shore and into about one foot of water where she lay perfectly quiet. The Mexicans then cautiously approached and slipped a noose over the tail, which was very broad, though the body just above it was but a few inches in diameter. When an attempt was made to pull her to shore, she made one more effort though but for an instant, when she quickly resigned herself to her fate. After she was nearly clear of the water eight men could not pull her more than one foot at a time, but she was finally landed well up on the beach. I did not venture near enough to measure her, but judged her body was eleven feet and her saw four feet long. At the shoulders I judged she was eighteen inches broad; thence it gradually tapered to the tail.

The extraordinary feature was the immobility of the animal under the circumstances; she was drawn in several hundred feet by a twine not larger than a knitting-needle, and she suffered herself to be dragged through the sand, tail foremost, without the least effort at resistance, or the least motion to show that she was suffering. I would like to know if this is usual with this fish when captured?

I learned that three well-grown fœtal saw-fish were found in her.—*J. D. Caton.*

INTELLIGENCE IN CANTHON.—The observation of Mr. Powell in your May number (page 124) on earth-worms reminded me of a similar display of reason in a *Canthon volvens*, which I think is worthy to be noted. One summer day I took a walk in the woods and met a beetle of the above kind singly pushing forward its ball in a straight direction, when it arrived at a certain point there was a slight declivity and the ball rolled sideways down about a yard; the beetle followed, and reaching the ball mounted and looked around. Then it descended and went to work again,

moving the ball at a large angle to a point about one and a half yards forward of the point, where it deviated and then proceeded in the original direction to a heap of dry leaves; it stopped pushing, entered the heap and commenced to pull the ball in. Evidently the beetle mounted the ball as a lookout for the right way. I was astonished, and if told should hardly have believed it, but I saw it.—*Fred. Brendel, Peoria, Ill.*

THE CALIFORNIA GRAY WHALE.—A schooner load of bones of this species, gathered in Scammon's Lagoon, Lower California, recently arrived in San Francisco, and were sold to be ground as fertilizers. Having examined a large number of the bones I can complete the characters of the genus *Rachianectes*, which have been but imperfectly known. The cervical vertebræ are all distinct, and the second and third at least enclose a vertebral canal. A first rib (the only one not broken up) has two heads; two other short ribs, perhaps first and second, are united distally into a broad sheet of bone. It is uncertain how far the union of these ribs is constant. The scapula has both coracoid and acromion. The orbital process of the frontal is of medium width, somewhat as in some species of *Megaptera.—E. D. Cope.*

THE JAPANESE LAP DOG (*Dysodus pravus*).—Since describing this form (Proceedings Academy, Philadelphia, July, 1879), I have had the opportunity of examining three other specimens in San Francisco. The first, which is in possession of Mrs. E. H. Harford, presents the following dental formula: I. $\frac{3}{3}$; C. $\frac{1}{1}$; Pre-m. $\frac{4}{3}$; M. $\frac{2}{2}$ The animal is young, as the exterior cusps only of the second superior tuberculars protrude through the gum. There is no internal tubercle of the inferior sectorial. The first superior premolar is a rudimental cusp; the second is very small, while the third is subtransverse in position. The dog is said not to be of pure race, which, perhaps, accounts for the presence of an additional premolar in each jaw. There are still one less below than in *Canis*, and will probably be early shed.

A second specimen, in possession of Mrs. Sargent, has the typical dentition: I. $\frac{3}{3}$; C. $\frac{1}{1}$; Pre-m. $\frac{2}{2}$; M. $\frac{2-1}{2-1}$. It is also young, as the milk inferior sectorial dropped from the gum as I examined it, and the outer edge of the second superior tubercular only is exposed. Curiously enough there is an inner tubercle of the inferior sectorial. This dog came from Yokohama, and is said to be pure. Its age is said to be three years and three months; it has been in possession of Mrs. Sargent two years.

The third specimen is of larger size, and is said to be ten years old. Its dental formula is I. $\frac{0}{1}$; C. $\frac{1}{1}$; Pre-m. $\frac{1}{1}$; M. $\frac{1}{2}$; no inner tubercle of inferior sectorial. The last true molar above has been shed, but the alveolus remains; this and the loss of the inferior incisors are characters plainly due to old age.

The above examples all maintain the characters of the genus

Dysodus. The hair of this species is rather long and is not curled, and is neither very coarse nor fine. Ears pendant. The colors in the three specimens are black and white, the former predominating in one, the latter in another.

The extra copies of the paper in which this species was described were issued during my absence from home, so that their date of publication was unfortunately omitted; this is August 23, 1879.—*E. D. Cope.*

ZOÖLOGICAL NEWS.—*The Rural Press*, August 2d, contains descriptions read before the Californian Academy of Sciences. It is unfortunate that these descriptions should appear in this heterodox manner, and we would urge the author to send his descriptions to some recognized scientific publication, where they may meet the notice of ichthyologists. The new forms are *Glyptocephalus zachirus*, *Chitonotus megacephalus* and *Caulolatilus princeps*, all from the Pacific coast.——A zoölogical station has been established in Scotland at Cowie, near Stonehaven, the work to be carried on under the direction of Mr. G. J. Romanes, in connection with Aberdeen University.——Dr. J. F. Brandt, the veteran Russian naturalist of St. Petersburg, died August 7th, aged 77. He left valuable manuscripts which will be published.——Prof. Allman's address as president of the British Association, began at Sheffield, August 20th, was on protoplasm.——Cobbold's Parasites: a treatise on the Entozoa of man and animals, will prove useful to students and medical men.——A reply to Principal Dawson's criticism of Mœbius' work on Eozoön by Mœbius himself appears in the *American Journal of Science* for September. ——Lubbock's scientific lectures just published by Macmillan & Co., will interest zoölogical students.——Mr. Moseley's Croonian lecture for 1878 was on the Stylasteridæ, a family of Hydroid stony corals.

ANTHROPOLOGY.[1]

ANTHROPOLOGICAL NEWS.—The second number of *Revue d'Anthropologie* for 1879 contains several papers of great importance. The first one is that by M. Florentino Ameghino upon pre-historic man in La Plata. The article is based upon an anthropological exhibit in the late Paris Exposition from the Argentine Republic. The author prefaces his discussion of the antiquity of man in La Plata with a chapter upon the American Aborigines, their antiquity and origin, in which he has brought together with rare diligence, from many literary sources, theories and statements concerning his subject. While many of these unproved opinions are stated only to be repudiated, others are retained and used as the bases of arguments which have no value whatever. The following story will suffice as an example: The Scandinavians were preceded by the Irish. An Irishman named Ari was driven by a tempest to

[1] Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.